SERVICE MANUAL

PUBLIC ADDRESS AMPLIFIER
MODEL PA2500RD,
PA2500D,
PA1500RD,
PA1500D

INKEL

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SPECIFICATIONS

Amplifier Section

Rated Output	PA-1500 (R) D : 60W (RMS)
	PA-2500 (R) D : 120W (RMS)
Frequency Response	80Hz to 20KHz
THD at 1KHz, Rated Output	Less than 1%
Tone Control	Bass +7/−12dB at 100Hz
	Treble +7/−12dB at 10KHz
Signal to Noise Ratio	More than 80dB
Input Sensitivity/Impedance	
MIC1, 2, 3	0.25mV/200-20KΩ
PHONO	2.5mV/47KΩ
AUX 1	80mV/47KΩ
AUX 2	1V/47KΩ, Variable 80mV to ∞.
Output Level/Impedance	
Speaker Output	PA-1500 (R) D : 100V/165Ω, 70V/83Ω
	PA-2500 (R) D : 100V/83Ω, 70V/42Ω
Line Output	1V/10KΩ
Muting Effect	40dB

Tuner Section (for Receiver)

Tuning Range	FM: 88-108MHz
	AM: 525-1620KHz
Antenna Input	FM: 300Ω
	AM: Low Impedance
Usable Sensitivity	FM: 8μV
	AM: 50μV
Signal to Noise Ratio	FM: 60dB
	AM: 45dB
Unit Dimensions	PA-2500 (R) D : 420(W) x 134(H) x 296(D) mm
	PA-1500 (R) D : 420(W) x 107(H) x 296(D) mm
Unit Weight	PA-1500 (R) D : 11.2Kg
	PA-2500 (R) D : 12.5Kg

NOTE: Specifications and the design subject to change without notice for improvements.

ELECTRICAL ADJUSTMENT PROCEDURE

1. AM SECTION

1-A. IF ALIGNMENT

a. Set the BAND SELECTOR switch to AM.
b. Set up the test equipment as Fig. 1-1 and set the GENESCOPE output level to 80dB (10mV).
c. Adjust T8C2, T803 and L803 so that the figure developed on the oscilloscope become laterally symmetrical with the axis of symmetry at 455 KHz and it has a maximum amplitude as well.

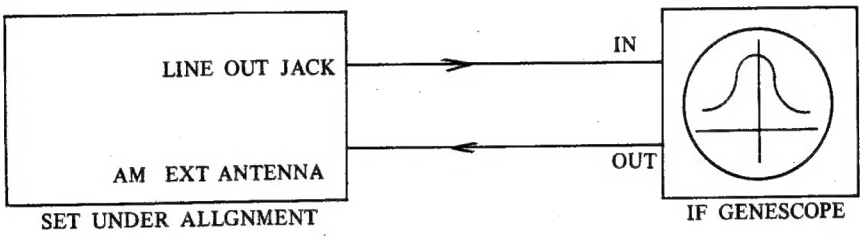


Fig. 1-1

1-B. RF TUNING ALIGNMENT

a. Set up the test equipment as Fig. 1-2.
b. Set AM SG to 30% modulation at 400Hz and 30-40dB output.
c. Turn the tuning control so that the dial pointer indicates 600KHz and tune AM SG to 600KHz and adjust T801 and L802 to maximize audio frequency output level.
d. Turn the tuning control so that the dial pointer indicates 1400KHz and tune AM SG to 1400 KHz and adjust AM trimmer capacitors on the varicon to maximize audio frequency output level.
e. Repeat steps c and d so that output is maximized at the given frequencies.

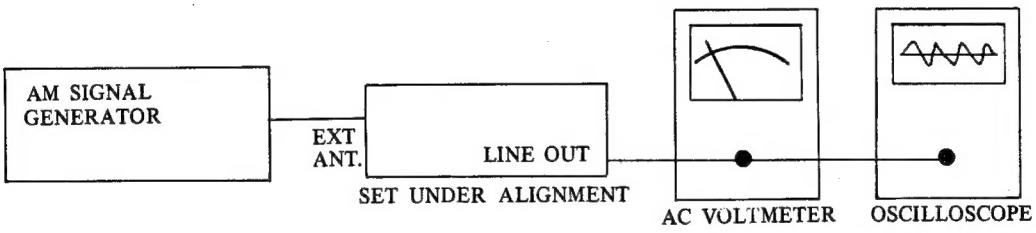


Fig. 1-2

2. FM SECTION

2-A. IF ALIGNMENT

a. Set the BAND SELECTOR switch to FM.
b. Set up the test equipment as Fig. 2-1.
c. Adjust the cores of T703 and T704 so that the S curve developed on the oscilloscope becomes point symmetry to the center frequency point of 10.7 MHz with a maximum amplitude.
d. If the GENESCOPE is not available, set the unit detuned and adjust the cores of T703 and T704 so that noise output is maximized.

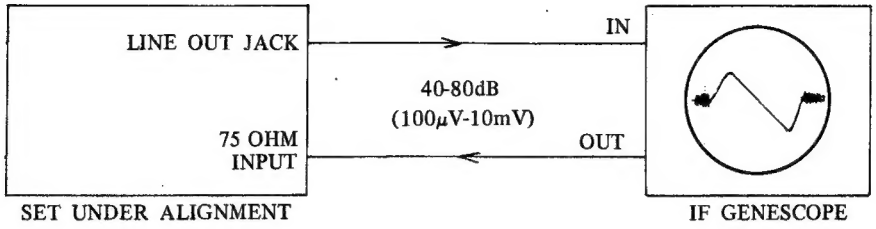


Fig. 2-1

2-B. RF TUNING ALIGNMENT

a. Set up the test equipment as Fig. 2-2.
b. Set FM SG to 100% modulation at 400Hz and 6-8dB output (2.0-2.5μV)
c. Turn the tuning control so that the dial pointer indicates 90.0MHz and tune FM SG to 90.0MHz and adjust cores of RF inductors, T701, T702 and L702 so that audio frequency output is maximized.
d. Turn the tuning control so that the dial pointer indicates 106MHz and tune FM SG to 106MHz and adjust FM trimmer capacitors on the varicon and CT701 so that audio frequency outptu is maximized.
e. Repeat steps c and d so that output is maximized at the given frequencies.

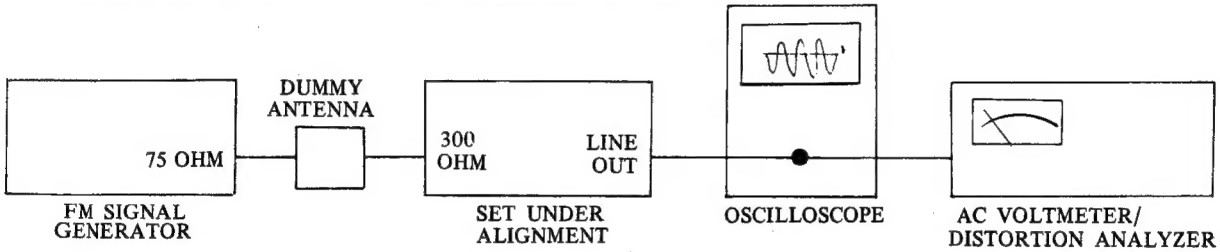


Fig. 2-2

3. MUTE LEVEL ADJUSTMENT

MIC 1, chime and siren signals have priority to the signal of MIC 3/PHONO and AUX input. You can adjust the mute level by adjusting SVR101, 100Kohm semifixed resistor on the PRE AMP PCB.

4. AUX2 INPUT SENSITIVITY ADJUSTMENT

You can adjust AUX2 input sensitivity by adjusting SVR102, 50Kohm semifixed resistor on the PRE AMP PCB.

5. SIREN FREQUENCY ADJUSTMENT

You can adjust siren frequency by adjusting SVR601, 100Kohm semifixed resistor on the CALL SIGN PCB.

6. CHIME FREQUENCY ADJUSTMENT

You can adjust chime frequency by adjusting SVR501, 20Kohm semifixed resistor, for the first tone, and SVR502, 20Kohm semifixed resistor, for the second tone.

7. CHIME SPEED ADJUSTMENT

You can adjust the chime speed by adjusting SVR503, 10Kohm semifixed resistor on the CALL SIGN PCB.

8. CHIME LEVEL ADJUSTMENT

You can adjust the chime level by adjusting SVR504, 20Kohm semifixed resistor on the CALL SIGN PCB.

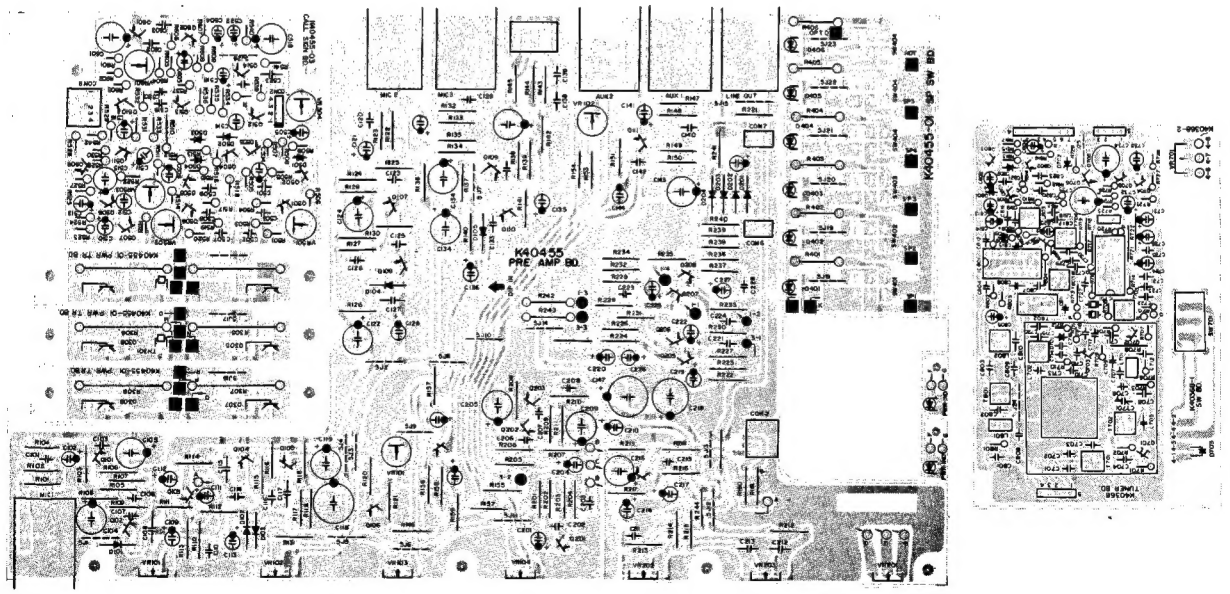
PARTS LIST

Ref No.	Parts No.	Description	Q'ty
K40368 TUNER BOARD			
IC701	2168411101	IC HA1137W	1
IC801	2168411104	IC HA1197	1
Q701	2018206101	FET 2KTK19 (GR)	1
Q702,Q703	2008406103	Transistor 3KTC1923 (Y)	2
Q704,Q705	2008606101	Transistor 2KTC732(BL)	2
Q706	2028416101	Transistor 2KTC1173(Y)	1
Q801,Q804	2008606105	Transistor 2KTC1815(O)	2
D701	2058806100	Diode 1S2236	1
D702	2058520116	Diode Zener WZ120	1
D703	2308060104	LED R208	1
D801,D802	2058304100	Diode CDG24	2
T701	2608001020	Coil FM ANT	1
T702	2618001040	Coil FM RF	1
T703	2838001020	Coil FM IFT	1
T704	2838501040	Coil FM Quad DET	1
L701	2648001020	Coil FM IF Trap	1
L702	2638001020	Coil FM OSC	1
L703	2648601190	Coil Inductor 18μH	1
T801	2608201010	Coil AM ANT	1
T802	2848101020	Coil AM IFT W/Ceramic	1
T803	2848001080	Coil AM IFT	1
L801	2648601200	Coil Inductor 220μH	1
L802	2638201030	Coil AM OSC	1
L803	284801010	Coil AM DET	1
K40455 PRE AMP BOARD			
Q101,Q107, Q109,Q203	2008206104	Transistor 2KTA970(BL)	4
Q102,Q103, Q108,Q110 Q111,Q112 Q201,Q202, Q204	2008606101	Transistor 2KTC732(BL)	9
Q104,Q105, Q106,Q205, Q208	2008606105	Transistor 2KTC1815(O)	5
Q206,Q207	2008206105	Transistor 2KTA1015(O)	2
D101,D105 D201,D204	2058304100	Diode CDG24	4
VR101 VR104, VR201		Potentio Meter 20KA Li25 VM10R	3
VR202, VR203		Potentio Meter 100KB Li25 VM10R	2
SVR101	3248310520	Resistor Semifixed 100KB SR19R	1
SVR102	3248347320	Resistor Semifixed 47KB SR19R	1
R242,R243	3039330472	Resistor M.O 33ohm 1W	2
C104,C105 C119,C122, C124,C132, C134,C143,	3409210140	Capacitor Elect 100μF/25V	11
C205,C209, C216			
C218	3409222140	Capacitor Elect 220μF 25V	1
C147	3409247140	Capacitor Elect 470μF 25V	1
K40455-01 PWR TR BOARD PA-1500(R)D			
Q305,Q308	2028407109	Transistor 2SD718(O)	2
TH301	2438210101	Thermistor ERT-D2 FHL503S	1
R305,R308	3059278782	Resistor CE 0.27ohm 5W SINGLE	2
K40455-01 PWR TR BOARD PA-2500(R)D			
Q305,Q308	2028407112	Transistor 2SD845(o)	2
TH301	2438210101	Thermistor ERT-D2 FHL503S	1
R305,308	3059278782	Resistor CE 0.27ohm 5W SINGLE	2
K40555-02 SPEAKER SELECTOR BOARD			
R401,R406	3039332472	Resistor M.O 3.3K ohm 1W	2
D401,D405	2308060303	LED G208	2
D406	230860104	LED R208	1
K40455-03 CALL SIGN BOARD			
Q501,Q506, Q513,Q514, Q601,Q602	2008606101	Transistor2KTC732(BL)	6
Q509	20086060105	Transistor 2KTC1815(O)	1
Q507,Q508, Q510,Q511, Q512	2008206105	Transistor 2KTA1015(O)	5
D501,D504	2058304100	Diode CDG24	2
SVR501, SVR502, SVR504	3248322320	Resistor Semifixed 22KB SR19R	3
SVR503	3248310320	Resistor Semifixed 10KB SR19R	1
SVR601	3248310420	Resistor Semifixed 100KB SR19R	1
C601	3409210140	Capacitor Elect 100μF 25V	1
C517	3409222140	Capacitor Elect 220μF 25V	1
C512,C514	34098110070	Capacitor N.P 10μF 16V	2
K40455-04 PWR IND BOARD			
D303	2308060104	LED R208	1
K40456 POWER SUPPLY BOARD PA-1500(R)D			
Q301,Q302,	2008606107	Transistor 2KTC2229(O)	2
Q303,Q304	2028406115	Transistor 2KTC1625(O)	2
Q309	2028406113	Transistor 2KTD 880(O)	1
D301	2058520110	Diode Zener WZ172	1
C303	3409210140	Capacitor Elect 100μF 25V	1
C305	3409222140	Capacitor Elect 220μF 25V	1

Ref No.	Parts No.	Description	Q'ty
C306	3419533221	Capacitor Elect 3300μF 50V	1
R303,R304	3039101472	**Resistor MO 100 ohm 1W**	2
R314	3039100472	Resistor MO 10 ohm 1W	1
R316	3039332472	Resistor MO 3.3K ohm 1W	1
F301 (For KS)	5508212430	Fuse NB 31.8 2A/250V KS	1
F301 (For Europe)	5508212430	Fuse NB 31.8 2A/250V KS	1
F302 (For KS)	5508212930	Fuse NB 31.8 4A/250V KS	1
F302 (For UL)	5508212933	Fuse NB 31.8 4A/250V UL	1
F303	5508213530	Fuse NB 31.8 10A/250V KS	1
K40456 POWER SUPPLY BOARD PA-2500(R)D			
Q301,Q302	2008606107	Transistor 2KTC2229(O)	2
Q303,Q304	2028406115	Transistor 2KTC1625(O)	2
Q309	2028406113	Transistor 2KTD 880(O)	1
D301	2058520110	Diode Zener WZ172	1

Ref No.	Parts No.	Description	Q'ty
C303	3409210140	Capacitor Elect 100μF 25V	1
C305	3409222140	Capacitor Elect 220μF 25V	1
C306	3409282270	Capacitor Elect 8200μF 50V	1
R303,R304	3039101472	Resistor MO 100 ohm (1W	2
R314	3039100472	Resistor M.O 10 ohm 1W	1
R316	3039322472	Resistor M.O 3.3K ohm 1W	1
F301 (For KS)	5508212930	Fuse NB 31.8 4A/250V KS	1
F301 (For Eurooe)	5508212930	Fuse NB 31.8 4A/250V KS	1
F302 (For KS)	5508213430	Fuse NB 31.8 8A/250V KS	1
F302 (For UL)		Fuse NB 31.8 8A/250V UL	1
F303	5508214030	Fuse NB 31.8 20A/31.8V KS	1
CHASSIS			
D302	2058100103	Diode Bridge PB252	1
D303	2058100102	Diode 16MQ40	1
C307	3609104140	Capacitor Mylar 0.1μF 200V	1

TOP VIEW OF P.C. BOARDS



• PA-1500D/RD PARTS LIST ACCORDING TO EXPLODED VIEW

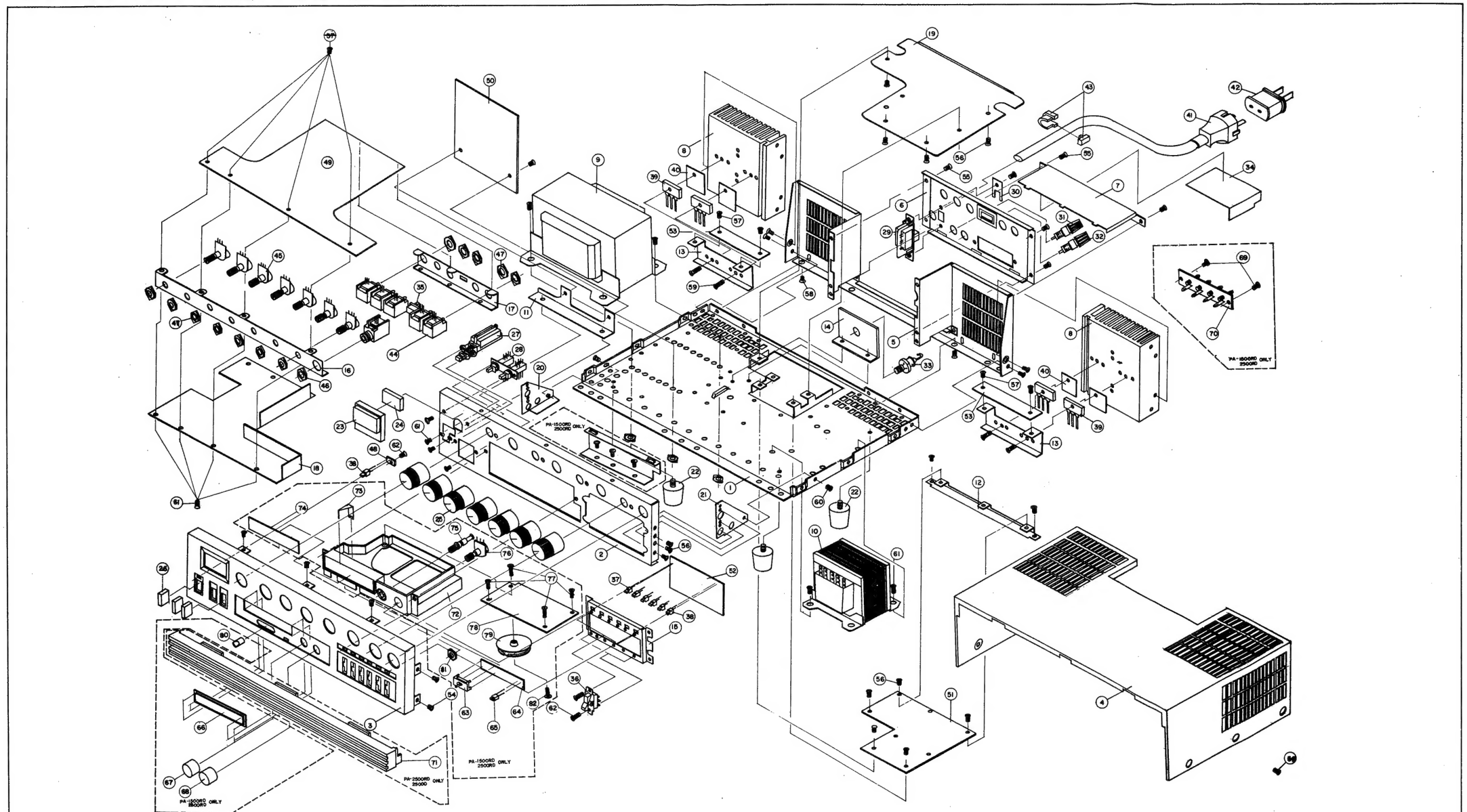
NO.	PARTS NO.	DESCRIPTION	Q'TY
1	62565	MAIN CHASSIS	1
2	62566	FRONT CHASSIS	1
3	61116-07	FRONT PANEL	1
4	74343	TOP COVER	1
5	62432	BACK CHASSIS	1
6	68950-01	BACK TERMINAL B. K. T	1
7	74342	COVER	1
8	73077-02	HEAT SINK	2
9	35240	POWER TRANS	1
10	35241	OUTPUT TRANS	1
11	68888	CHIME B. K. T	1
12	68893	PCB B. K. T	1
13	68718	TR B. K. T	2
14	68894	DIODE B. K. T	1
15	68710	SPEAKER SELECTOR B. K. T	1
16	68717	PRE AMP PCB B. K. T	1
17	68719	JACK B. K. T	1
18	68721	SHIELD PLATE	1
19	62563	BUTTON COVER	1
20	68708-02	ASSISTANCE B. K. T(L)	1
21	68709-02	ASSISTANCE B. K. T(R)	1
22	71259	FOOT ASS'Y	4
23	75055	LEVEL METER	1
24	72304	SPONGE	1
25	72301	CONTROL KNOB	7
26	25365-02	PUSH KNOB	3
27	90280	POWER SWITCH	1
28	90298	PUSH SWITCH	1
29	90277	VOLTAGE SELECTOR SWITCH	1
30	69101-02	VOLTAGE SELECTOR HOLDER	1
31	67036A	DC TERMINAL ASS'Y	1
32	67036A-02	DC TERMINAL ASS'Y	1
33		DIODE S10C4W/MICA	1
34	70073	INSULATION PLATE	1
35	90299	SLIDE SWITCH	1
36	90300	LOCK SWITCH	6
37	G208	LED	5
38	G208	LED	2
39	2SD718	TR	4
40		INSULATION MICA	4

NO.	PARTS NO.	DESCRIPTION	Q'TY
41	67168	AC CORD	1
42	67169	AC CORD ADAPTOR	1
43	71050	CORD STOPPER	1
44	95057	PHONE JACK	6
45	15112	POTENTIO METER	7
46		NUT	6
47		NUT	7
48	K40455-06	POWER LED PCB	1
49	K40455	PRE AMP PCB	1
50	K40455-05	CHIME PCB	1
51	K40455-01	SUB PCB	1
52	K40455-03	SPEAKER SELECTOR PCB	1
53	K40455-04	TR PCB	1
54	BM4×6(B)	SCREW	13
55	♯3BTC3×6(B)	SCREW	7
56	BTC3×6(B)	SCREW	10
57	♯3WPTC3×6	SCREW	8
58	BTC 3×6	SCREW	33
59	PTC 3×16	SCREW	4
60	PM 4×6	SCREW	2
61	WPM 4×8	SCREW	8
62	BTC 3×8	SCREW	11
63	90301	LEVER SWITCH	1
65	R208	LED	1
66	63161	LENS	1
67	72303-01	CONTROL KNOB	1
68	72303-02	CONTROL KNOB	1
69	♯3BTC3×8(B)	SCREW	2
70		FM DIPOLE ANT	1
72	61118	TUNER BOX	1
73	66085	DIAL POINTER	1
74	63162A	DIAL SCALE	1
75	65057	TUNING SHAFT	1
76	15113	POTENTIO METER	1
77	WPTC3×8	SCREW	4
78	K40368	TUNER PCB	1
79	66084	DIAL DRUM	1
80	72302	LEVER SWITCH KNOB	1
81		NUT	1
82	PM2.6×10	SCREW	1

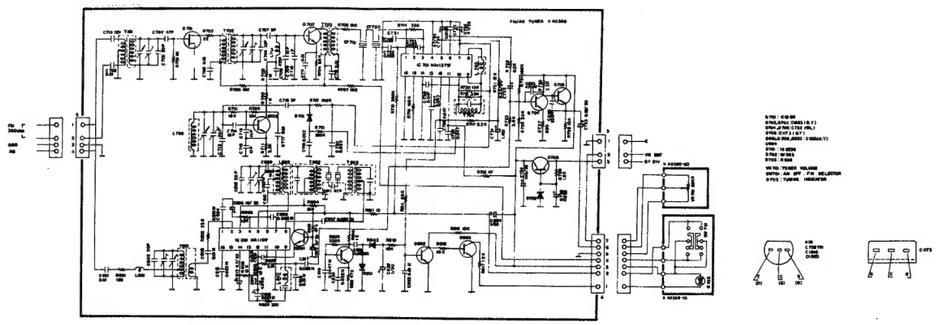
•PA-2500D/RD PARTS LIST ACCORDING TO EXPLODED VIEW

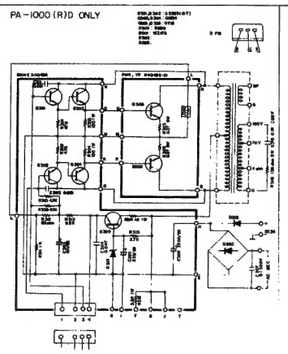
NO	PARTS NO.	DESCRIPTION	Q'TY
1	62565	MAIN CHASSIS	1
2	62567	FRONT CHASSIS	1
3	61116-05	FRONT PANEL	1
4	74344	TOP COVER	1
5	62428	BACK CHASSIS	1
6	68951-01	BACK TERMINAL B. K. T	1
7	74342	COVER	1
8	73077-01	HEAT SINK	2
9	35238	POWER TRANS FORMER	1
10	35239	OUTPUT TRANS FORMER	1
11	68888	CHIME B. K. T	1
12	68893	PCB B. K. T	1
13	68718	TR B. K. T	2
14	68894	DIODE B. K. T	1
15	68710	SPEAKER SELECTOR B. K. T	1
16	68717	PRE AMP PCB B. K. T	1
17	68719	JACK B. K. T	1
18	68721	SHIELD PLATE	1
19	62563	BOTTOM COVER	1
20	68708-02	ASSISTANCE B. K. T(L)	1
21	68709-02	ASSISTANCE B. K. T(R)	1
22	71259	FOOT ASS'Y	4
23	75055	LEVEL METER	1
24	72304	SPONGE	1
25	72301	CONTROL KNOB	7
26	25365-02	PUSH KNOB	3
27	90280	POWER SWITCH	1
28	90298	PUSH SWITCH	1
29	90277	VOLTAGE SELECTOR SWITCH	1
30	69101-02	VOLTAGE SELECTOR HOLDER	1
31	67036A	DC TERMINAL ASS'Y	1
32	67036A-02	DC TERMINAL ASS'Y	1
33		DIODE S10C4W/MICA	1
34	70073	INSULATION PLATE	1
35	90299	SLIDE SWITCH	1
36	90300	LOCK SWITCH	6
37	G208	LED	5
38	R208	LED	2
39	2SD718	TR	4
40		INSULATION MICA	4
41	67168	AC CORD	1
42	67169	AC CORD ADAPTOR	1
43	71050	CORD STOPPER	1
44	95057	PHONE JACK	6
45	15112	POTENTIO METER	7
46		NUT	6
47		NUT	7
48	K40455-06	POWER LED PCB	1
49	K40455	PRE AMP PCB	1
50	K40455-05	CHIME PCB	1
51	K40455-01	SUB PCB	1
52	K40455-03	SPEAKER SELECTOR PCB	1
53	K40455-04	TR PCB	1
54	BM4×6(B)	SCREW	13
55	#3BTC3×6(B)	SCREW	7
56	BTC3×6(B)	SCREW	10
57	#3WPTC3×6	SCREW	8
58	BTC3×6	SCREW	33
59	PTC3×16	SCREW	8
60	PM4×6	SCREW	2
61	WPM4×8	SCREW	8
62	BTC3×8	SCREW	11
63	90301	LEVER SWITCH	1
64	R208	LED	1
66	63161	LENS	1
67	72303-01	CONTROL KNOB	1
68	72303-02	CONTROL KNOB	1
69	#3BTC3×8(B)	SCREW	2
70	67029	FM DIPOLE ANT	1
71	61117	GRILL	1
72	61118	TUNER BOX	1
73	66085	DIAL POINTER	1
74	63162A	DIAL SCALE	1
75	65057	TUNING SHAFT	1
76	15113	POTENTIO METER	1
77	WPTC3×8	SCREW	4
78	K40368	TUNER PCB	1
79	66084	DIAL DRUM	1
80	72302	LEVER SWITCH KNOB	1
81		NUT	1
82		PM2.6×10	1

EXPLODED VIEW OF CABINET AND CHASSIS

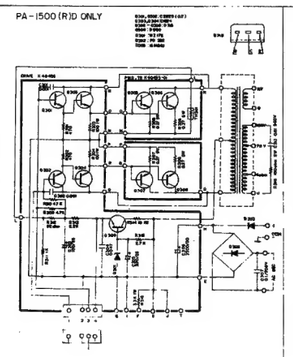


SCHEMATIC DIAGRAM

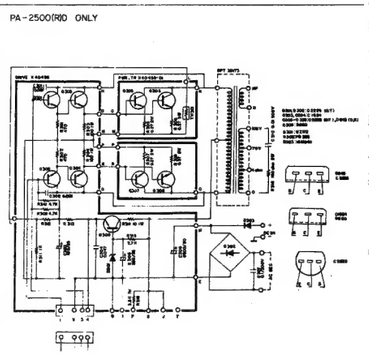




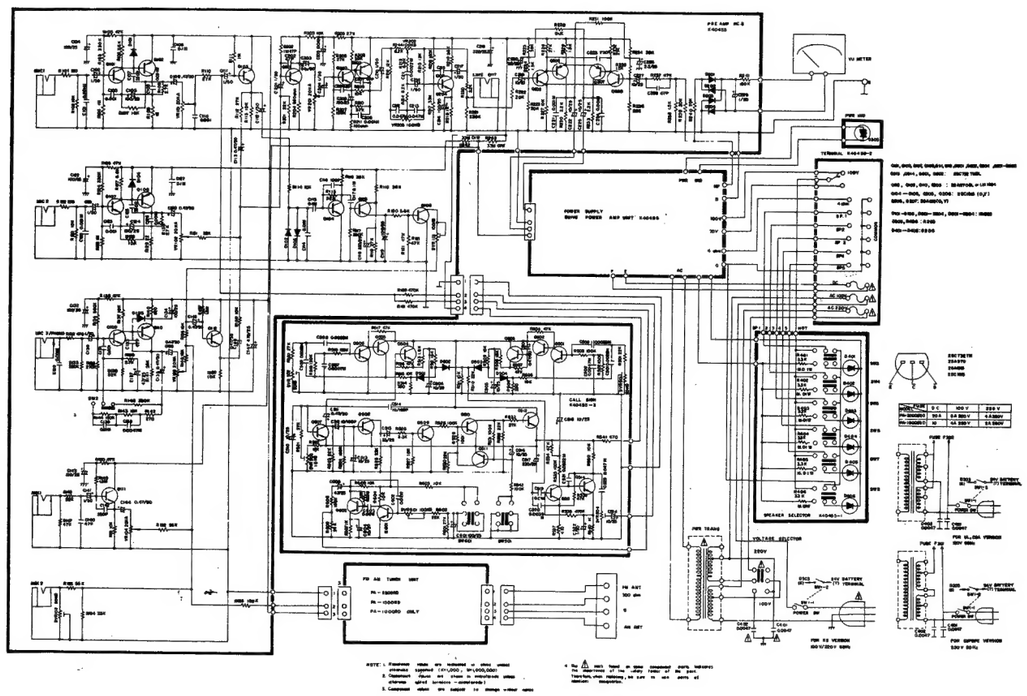
PA-1000(R)D ONLY



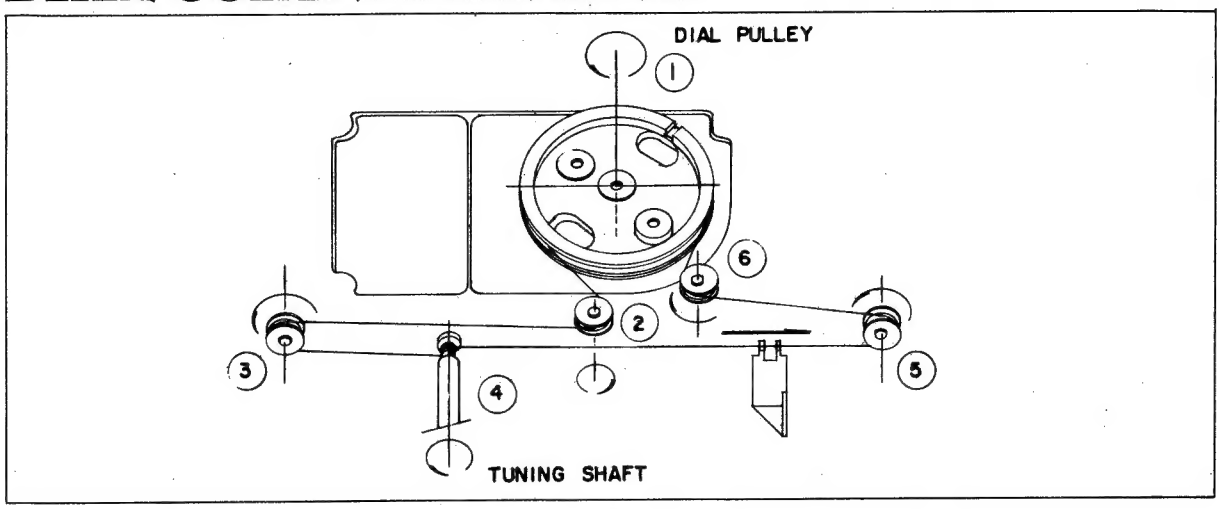
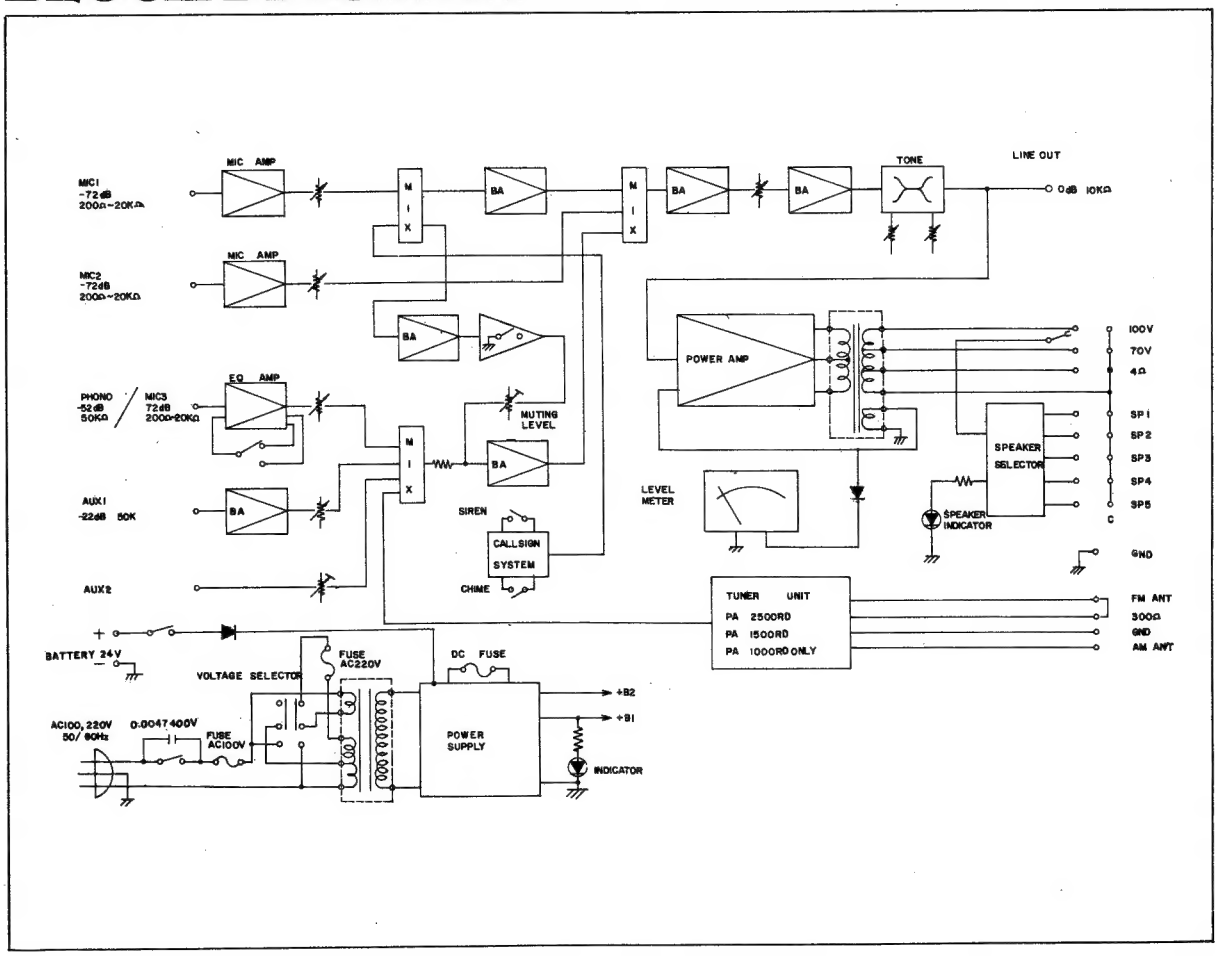
PA-1500(R)D ONLY



PA-2500(R)D ONLY



DIAL CORD STRINGING



BLOCK DIAGRAM